

AMENDMENTS TO THE CLAIMS

Please replace the pending claims with the following claim listing:

1. **(Currently Amended)** An apparatus for producing crystals wherein a seed crystal is placed in the crucible retained in a furnace, raw materials filled in the crucible are heated and liquefied, and a crystal grown by slow cooling of raw materials in the crucible from below upward, said apparatus comprising:

a temperature controlling means ~~[[for]]~~ including a hollow constructed cap mounted outside the crucible where the seed crystal is placed and means for regulating refrigerant flow running through the hollow portion;

wherein the cross section of said cap varies in size along path direction of the refrigerant flow and the temperature controlling means performs cooling or heating in the vicinity of the seed crystal locally.

2. **(Cancelled)**

3. **(Currently Amended)** The apparatus for producing the crystals according to Claim ~~[[2]]~~ 1, wherein:

the cap is divided in multiple caps; and

the temperature controlling means comprises means for regulating independently refrigerant flow running through each hollow portion of the multiple caps.

4. **(Cancelled)**

5. **(Currently Amended)** The apparatus for producing the crystals according to Claim ~~[[2]]~~ 1, wherein the cap includes a heater and the temperature controlling means comprises means for performing conducting control to a heater with the refrigerant flow regulation.

6. **(Currently Amended)** The apparatus for producing the crystals according to Claim ~~[[2]]~~ 1, wherein the material of the cap consists of one of a metal having conductive property, heat-resistant and corrosion-resistant of Pt or the equivalent, and an oxide having conductive property, heat-resistant and corrosion-resistant.

7. **(Currently Amended)** ~~[[The]]~~ An apparatus for producing ~~[[the]]~~ crystals according to ~~Claim 1~~ wherein a seed crystal is placed in the crucible retained in a furnace, raw materials filled in the crucible are heated and liquefied, and a crystal grown by slow cooling of raw materials in the crucible from below upward, said apparatus comprising:

~~[[the]]~~ a temperature controlling means comprises including a helical pipe mounted outside the crucible where the seed crystal is placed, and means for regulating refrigerant flow running through the ~~pipe pipe~~;

wherein the cross section of the pipe varies in size along path direction of the refrigerant flow and the temperature controlling means performs cooling or heating in the vicinity of the seed crystal locally.

8. **(Original)** The apparatus for producing the crystals according to Claim 7 wherein the temperature controlling means regulates the refrigerant flow by introducing refrigerant running through the pipe from lower portion of the seed crystal and discharging to the upper portion thereof.

9. **(Previously Presented)** The apparatus for producing the crystals according to Claim 7 wherein:

the pipe is divided in multiple pipes; and

the temperature controlling means comprises a means for regulating independently refrigerant flow regulation running through each of the multiple pipes.

10. **(Canceled)**

11. **(Currently Amended)** The apparatus for producing the crystals according to Claim 7, wherein the pipe includes a heater and the temperature controlling means comprises means for performing conducting control to a heater with the refrigerant flow regulation.

12. **(Currently Amended)** The apparatus for producing the crystals according to Claim 7, wherein the material of the pipe consist of one of a metal having conductive property, heat-resistant and corrosion-resistant of Pt or the equivalent, and an oxide having conductive property, heat-resistant and corrosion-resistant.

13. **(Canceled)**

14. **(Canceled)**